

U90xxA X-Series Measurement Applications for the EXT Wireless Communications Test Set

- Leverage the industry-proven Agilent X-Series measurements applications for the EXT wireless communications test set in non-signaling wireless device manufacturing
- Accelerate test sequences with EXT's powerful and flexible sequencer—for fast, multiple measurements from a single acquisition
- Achieve fast and accurate measurements, optimized for non-signaling test techniques in high-throughput manufacturing test applications

Anticipate ___Accelerate ___Achieve

Agilent Technologies

Introduction

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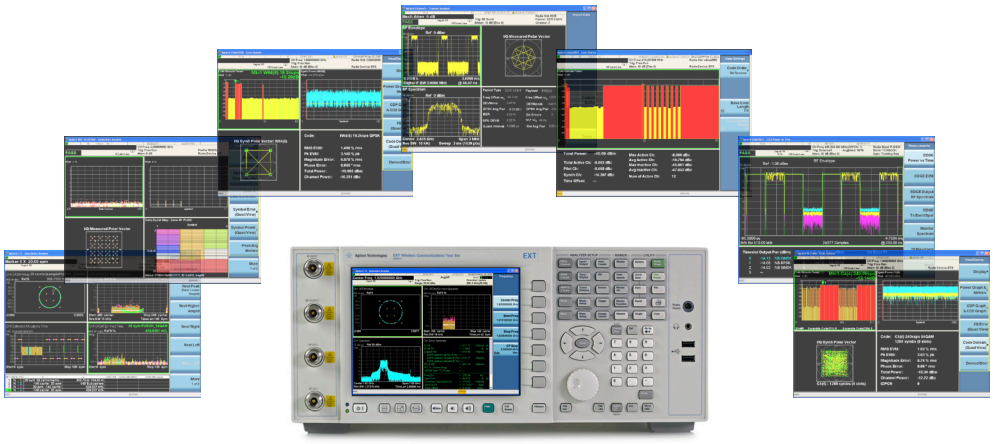
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Leveraging the industry-proven expertise in X-Series measurement applications, the Agilent Technologies U90xxA X-Series measurement applications for the EXT wireless communications test set deliver fast and accurate measurements for high-throughput manufacturing applications.

The U90xxA inherited the one-button RF conformance measurements from other X-Series applications to help you design, evaluate, and manufacture your devices and equipment, and enable you to stay on the leading edge of your design and manufacturing challenges.

The EXT is part of Agilent's comprehensive Power of X Suite of test products and the standard unit includes a source list sequencer and sequence analyzer. The powerful sequence analyzer function provides a host of capabilities to increase speed and throughput in non-signaling manufacturing test. Capabilities include full-featured analysis tools and source synchronization, all designed to match the needs of current and future chipsets.





U90xxA X-Series Measurement Applications

Execute test plans at the chipset's highest achievable speed using the powerful and flexible EXT sequencer

- Provides a test solution that is designed for non-signaling, ultra-fast device calibration and verification
- Works in synch with chipset test modes to eliminate signaling overhead
- Enables single acquisition with multiple measurements
- Allows precise control of test intervals, test levels, and measurement timing
- Provides more flexibility and capability than "list mode"
- Performs multi-technology sweeps

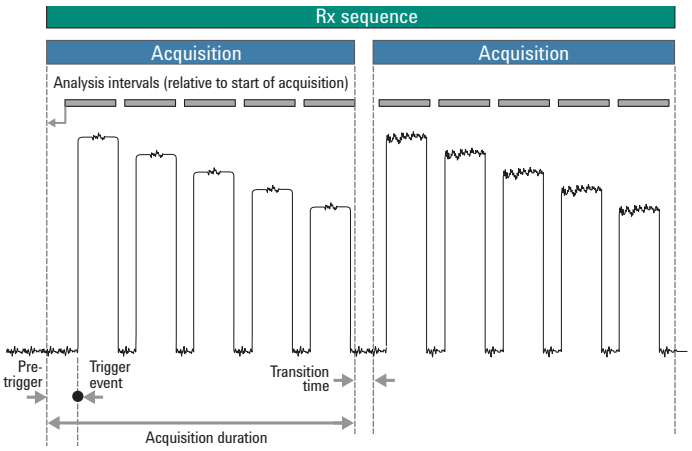


Figure 1:
A receiver test sequence consisting of two acquisitions, and single acquisition with multiple measurements

Format	Measurement Application		Signal Studio*
	Sequence analyzer	1-button measurements	
GSM/EDGE/Evo	●	●	●
W-CDMA/HSPA/HSPA+	●	●	●
cdma2000, 1xEV-DO	●	●	●
LTE-FDD	●	●	●
LTE-TDD[1]	X	●	●
TD-SCDMA[1]	X	●	●
Mobile WiMAX	X	●	●
Bluetooth	X	●	●
Analog demodulation	X	●	●

Ilustrates which wireless formats have been enabled in the sequence analyzer.

**For more information on Signal Studio www.agilent.com/find/signalstudio*

1. Contact your Agilent Technologies Sales Representative for more information.

U90xxA X-Series Measurement Applications

Reduce total cost of ownership

With an architecture optimized for low-cost, non-signaling test, the EXT wireless communications test set enables you to keep your test assets current, agile, and scalable for extended instrument longevity. The forward-looking hardware, and software scalability for technology and chipset test-mode advances, preserves your investment and reduces long term costs. The EXT minimizes test times, improves production yields, and minimizes downtime, helping you reduce operating expenses on your production line.

Benefit from a consistent measurement framework

Realize measurement integrity across your organization with consistent operation and test methods, proven algorithms, applications, and results. Your team can leverage the test system software through all phases of product development, allowing them to move at a faster pace. Whether you run them on the PXA, MXA, EXA, CXA, or EXT, you'll get the same results from the development lab into manufacturing. The only difference is the level of performance achieved by the instrument hardware, so you can choose the level of performance necessary for your application. And with consistent programming commands used across the X-Series, you minimize the effort and cost of creating test systems. A common, familiar user interface means increased efficiency and productivity—when you learn how to use one X-Series product, you know how to use them all.

Enhance and customize your data analysis power

With the open Windows® XP operating system, you can create customized demodulation macros and run applications such as MATLAB, which allows you to further analyze and visualize your wireless data, execute and test modulation schemes, and develop automated tests.

Try before you buy!

Free 14-day trials of X-Series measurement applications are available.
www.agilent.com/find/X-Series_ext_trial



Product Summary

Cellular communications

Technology	U90xxA measurement application model number	Perpetual license	
		Fixed	Transportable
LTE-FDD	U9080A-1	U9080A-1FP	U9080A-1TP
LTE-TDD	U9082A-1	U9082A-1FP	U9082A-1TP
GSM/EDGE	U9071A-2	U9071A-2FP	U9071A-2TP
EDGE Evo	U9071A-3	U9071A-3FP	U9071A-3TP
cdma2000	U9072A-2	U9072A-2FP	U9072A-2TP
W-CDMA	U9073A-1	U9073A-1FP	U9073A-1TP
HSDPA/HSUPA	U9073A-2	U9073A-2FP	U9073A-2TP
HSPA+	U9073A-3	U9073A-3FP	U9073A-3TP
1xEV-DO	U9076A-1	U9076A-1FP	U9076A-1TP
HSPA+	U9073A-3	U9073A-3FP	U9073A-3TP
TD-SCDMA	U9079A-1	U9079A-1FP	U9079A-1TP
HSPA	U9079A-2	U9079A-2FP	U9079A-2TP

Wireless connectivity

Technology	U90xxA measurement application model number	Perpetual license	
		Fixed	Transportable
Bluetooth	U9081A-2	U9081A-2FP	U9081A-2TP
Mobile WiMAX	U9075A-2	U9075A-2FP	U9075A-2TP

General purpose

Technology	U90xxA measurement application model number	Perpetual license	
		Fixed	Transportable
Analog demodulation	U9063A-2	U9063A-2FP	U9063A-2TP



Cellular Communications

The cellular communication measurement applications cover a full range of technologies—from existing 2G/3G systems to evolving 3.5G and 4G communication systems. These measurement applications adhere to the 3GPP and 3GPP2 standards, and closely follow standards as they change—allowing you to stay on the leading edge of your design and manufacturing challenges.

LTE-FDD

LTE-FDD measurements per 3GPP Release 9 standard

- All LTE bandwidths: 1.4 to 20 MHz
- User equipment (UE): EVM, frequency error, I/Q offset, and in-band emissions
- Channel power, occupied bandwidth, and ACP
- Multiple color-coded result views: EVM vs. subcarrier, EVM vs. symbol, EVM vs. slot, EVM, vs. resources block (RB), detected allocations (subcarrier vs. symbol), error summary table, frame summary table, and more

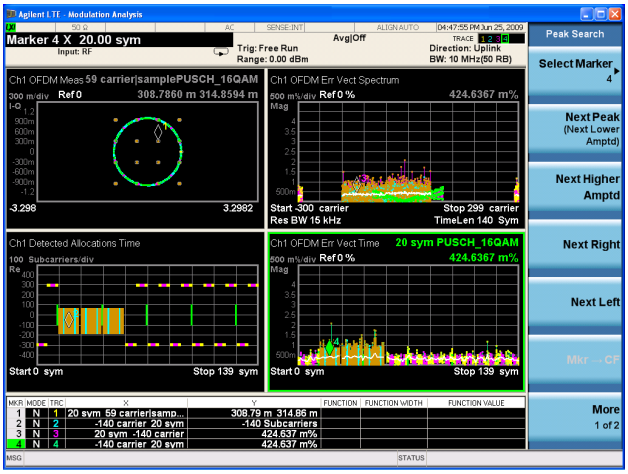


Figure 2:
LTE-FDD

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LTE-TDD

LTE-TDD measurements per 3GPP Release 9 standard

- All LTE bandwidths: 1.4 to 20 MHz
- User equipment (UE): EVM, frequency error, I/Q offset, spectrum flatness, in-band emissions, SEM, ACLR, and more
- Transport layer channel decoding: Access to demapped, deinterleaved, descrambled, deratematched, and decoded data
- Multiple color coded result views: EVM vs. subcarrier, EVM vs. symbol, EVM vs. slot, EVM vs. resource block (RB), detected allocations (subcarrier vs. symbol), error summary table, frame summary table, and more

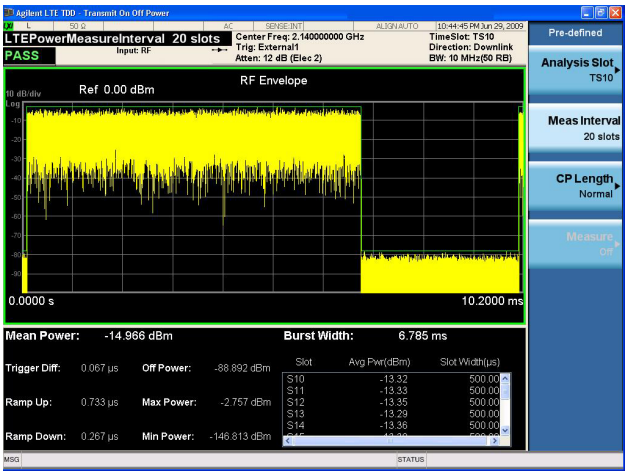


Figure 3:
LTE-TDD

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GSM/EDGE/EDGE Evo

GSM, EDGE, and EDGE Evo measurements per 3GPP GERAN standard

GSM/EDGE measurements

- Transmit power and power vs time (PvT) with multi-slot capability
- Error vector magnitude (EDGE only), and phase and frequency error (GSM only) through polar vector and constellation displays
- GSM/EDGE loopback BER[1]

EDGE Evo measurements

- Normal burst (NB) support: GMSK, 8PSK, 16QAM, and 32QAM
- High symbol rate (HSR) burst support: QPSK, 8PSK, 16QAM, and 32QAM including spectrally-narrow and wide-pulse shaping Tx filter
- Auto-detection and synchronization for all modulation formats including mixed slots containing NB and HSR bursts, plus enhanced trigger hold-off setting for stable burst detection

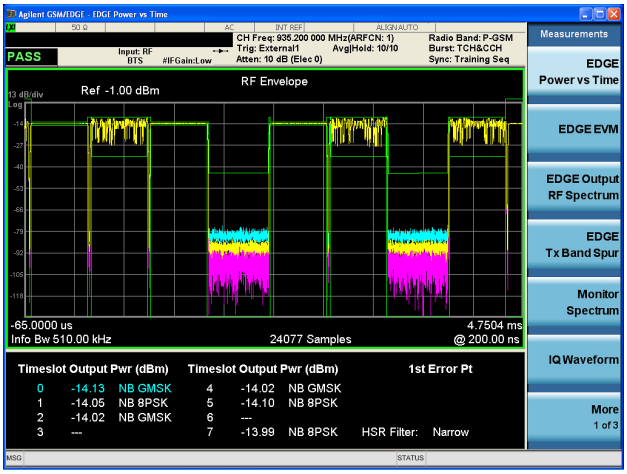


Figure 4:
GSM/EDGE/EDGE Evo

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W-CDMA/HSPA/HSPA+

W-CDMA, HSPA, and HSPA+ measurements per 3GPP release 99 to 8

W-CDMA measurements

- Auto-detection and analysis of W-CDMA channels and signals
- EVM, peak code domain error, frequency error, code domain power, plus more
- Channel power, ACP, occupied bandwidth
- PRACH power and slot power measurements
- W-CDMA loopback BER[1]

HSPA (HSDPA/HSUPA)/HSPA+ measurements

- Auto-detection and analysis of 4PAM-I/Q (16QAM) E-DPDCH, 64QAM HS-PDSCH, plus preset for Test Model 6
- HS-DPCCH, E-DPCCH, and E-DPDCH auto detection, and power beta calculations with DPCH/E-DPCH configuration settings
- EVM, peak code domain error, frequency error, code domain power, plus more
- Channel power, ACP, occupied bandwidth, and ACP

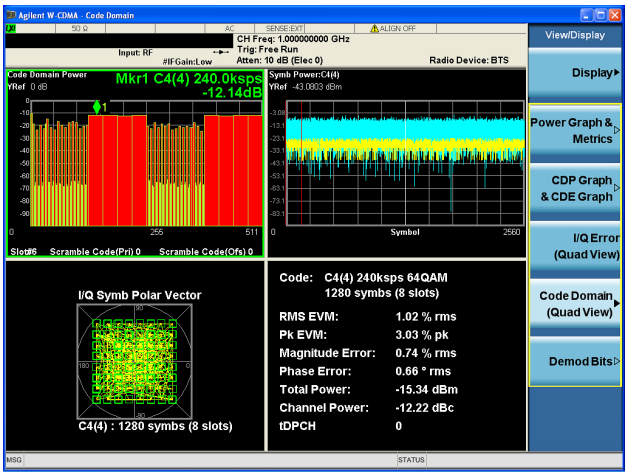


Figure 5:
W-CDMA/HSPA/HSPA+

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1. Supported by Sequence Analyzer Mode.

cdma2000/cdmaOne

cdmaOne and cdma2000 measurements per 3GPP2 Release A

- Composite rho and EVM, QPSK EVM, code domain error, frequency error, time offset, and power measurements
- Automatic detection of forward link signals from radio configuration (RC) 1 to 5
- Displays code domain power (CDP) results in Hadamard code or bit-reverse
- Specifies chip and PN offsets, and measurement interval from 1 to 32 PCG (1 PCG=1536 chips)

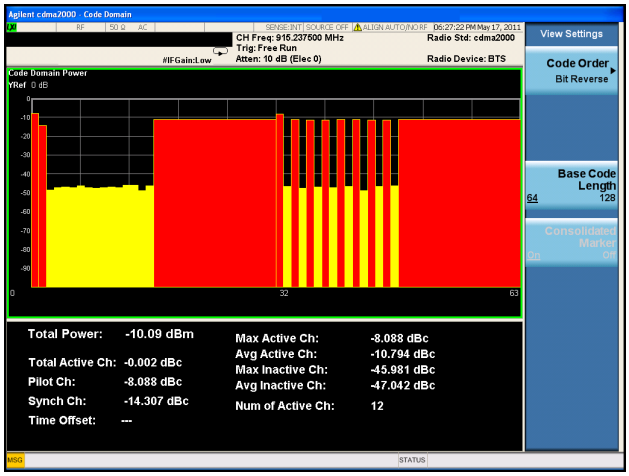


Figure 6:
cdma2000/cdmaOne

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1xEV-DO

1xEV-DO measurements per Rel 0, Rev A and Rev B of 3GPP2 standard

- Reverse link: Composite EVM and rho, CPE, CDE, I/Q chip errors, code domain, channel power, and ACP
- Auto-detection for data channels QPSK, 8PSK, 16QAM, and 64QAM
- For reverse link, supports channel types including pilot, RRI, data, ACK, DRC, DSC, and auxiliary pilot

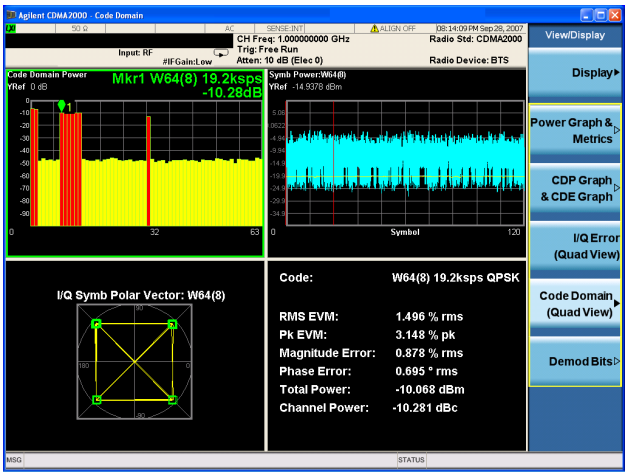


Figure 7:
1xEV-DO

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Cellular Communications

TD-SCDMA/HSPA

TD-SCDMA/HSPA measurements per 3GPP release 99 to 8 standards

- Uplink: EVM, frequency stability, transmit On/Off power, PkCDE, SEM, ACLR, and more
- Automatic detection of QPSK, 16QAM, and 8 PSK in code domain and modulation accuracy analysis
- Multiple result views: Constellation diagram, code domain, numeric display, spectrum, and time domain

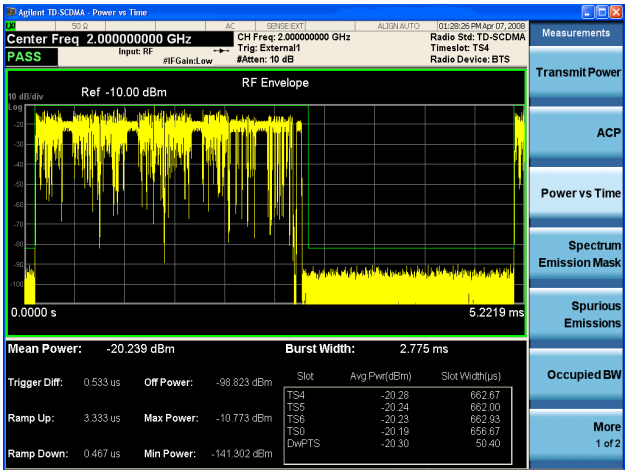


Figure 8:
TD-SCDMA/HSPA

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Wireless Connectivity

The wireless connectivity measurement applications cover technologies including *Bluetooth* through Mobile WiMAX. As technology advances, U90xxA X-Series measurement applications are also advancing, enabling you to continue tackling increasingly complex design and manufacturing test challenges.

Mobile WiMAX

Mobile WiMAX measurements per IEEE 802.16 2005 standard

- RCE (EVM), RSSI, preamble PCINR, subcarrier flatness, and IQ metrics
- Time-gated power measurements: ACP and channel power
- Center frequency tolerance, symbol clock frequency tolerance, and power rise/fall
- Delivers relative constellation error (RCE) in multiple levels (composite, pilot, data burst, un-modulated, and preamble)

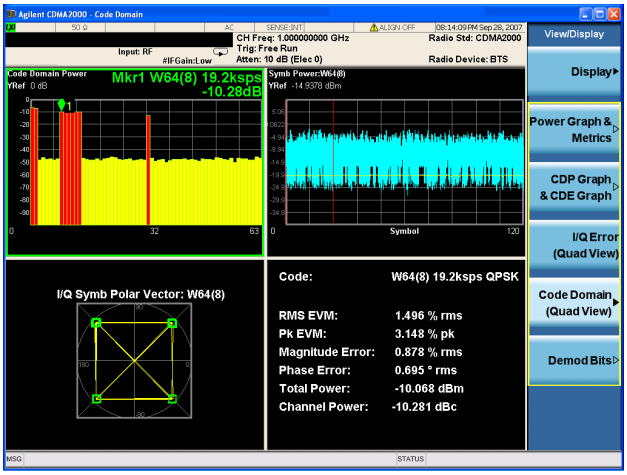


Figure 9:
Mobile WiMAX

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Bluetooth

Bluetooth measurements per Core Specification Version 2.1+ EDR and 4.0 Low Energy

- Transmitter analysis of combined output power (basic rate or low energy) or EDR relative power and modulation measurements associated with multiple results at a single time
- Modulation: Deviation, initial carrier frequency tolerance (ICFT), carrier frequency drift, EDR frequency stability, and EDR modulation accuracy
- Multiple result views: RF envelope, demodulation waveform, and numeric display

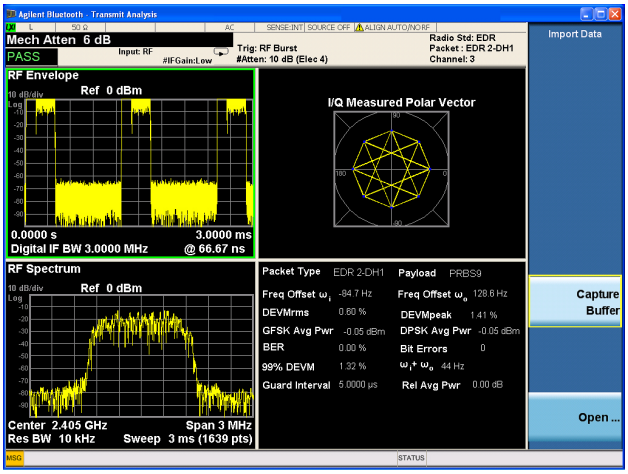


Figure 10:
Bluetooth

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General Purpose

Analog demodulation is one of the general purpose X-Series measurement applications that has been leveraged for the EXT to expedite the development and manufacturing of various transmitting devices. Supported one-button measurements include all of the modulation quality plus I/Q waveform measurements.

Analog demodulation

- Modulations analysis for AM, FM and PM signals
- Analyze analog modulation signals with a selection of detectors: Peak+, Peak-, (Pk-Pk)/2 and RMS
- View RF spectrum, demodulated waveform, AF (modulating signal) spectrum, and demodulation metrics table at the same time with quad view
- Play the modulating signal over a speaker ("tune and listen")

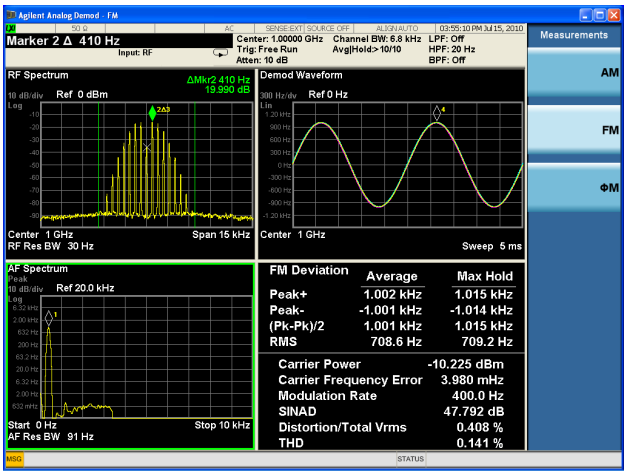


Figure 11:

Analog demodulation

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Flexible Software Licensing

Software licensing and configuration

Choose from two license types:

Fixed, perpetual license
A fixed license is the traditional licenses and ties an application to a specific instrument. Once installed, the license cannot be moved to another instrument and it becomes part of the test asset.

Transportable, perpetual license
The transportable license allows an application to be moved between instruments, providing you the flexibility to manage test and measurement capabilities in your organization, across the lab or around the globe, as your business needs evolve. A transportable license is available for all U90xxA X-Series applications. Please refer to the Product Summary for specific availability.

You Can Upgrade!

Options can be added after your initial purchase.

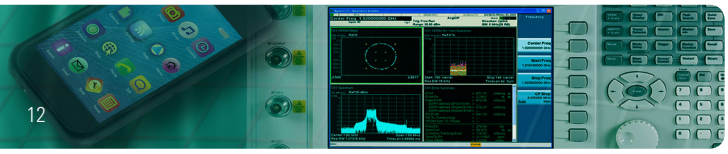
All of our X-Series application options are license-key upgradeable

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Revised: October 11, 2012

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© Agilent Technologies, Inc. 2012
Published in USA, November 8, 2012
5991-0044EN

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